

Appl. No. : 09/195,791
Filed : November 17, 1998

AMENDMENTS TO THE CLAIMS

1. (Canceled)
2. (Canceled)
3. (Canceled)
4. (Canceled)
5. (Canceled)
6. (Canceled)
7. (Canceled)
8. (Canceled)
9. (Canceled)
10. (Canceled)
11. (Canceled)
12. (Canceled)
13. (Canceled)
14. (Canceled)
15. (Previously presented) A system for the enhancement of physiological signals for the measurement of blood oxygen in a subject,

the system comprising:

first and second light sources to direct light toward the subject, said first and second light sources producing light of first and second wavelengths, respectively;

a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated

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signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;

a packet generator to generate a plurality of data packets derived from data comprising said first and second generated signals;

wherein said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal have a mathematical relationship; and

a calculator using said mathematical relationship to generate at least first and second functions from said plurality of data packets, said at least first and second functions having a final solution value indicative of said ratio.

16. (Previously presented) The system of Claim 15 wherein said ratio is indicative of blood oxygen saturation in the subject, the system further including a look-up table containing data relating said ratio to said blood oxygen saturation.

17. (Previously presented) The system of Claim 15 wherein at least one of said data packets comprises filtered data from at least one of said first and second generated signals.

18. (Previously presented) The system of Claim 15 wherein at least one of said data packets comprises a component of at least one of said first and second generated signals with the DC removed.

19. (Previously presented) The system of Claim 15 wherein at least one of said data packets is derived from a group of signals comprising said first generated signal, filtered data

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from said first generated signal, said second generated signal, filtered data from said second generated signal, and filtered data from a combination of said first and second generated signals.

20. (Previously presented) The system of Claim 15 wherein said mathematical relationship has the following form:

$$-R_1(t_i) + (r_a + r_v)R_{12}(t_i) - r_a r_v R_2(t_i) = 0$$

where r_a is said ratio, $i=1$ to 2 for said first and second data packets, respectively, $R_1(t_i)$ is the energy of said first generated signal in the i th data packet, $R_2(t_i)$ is the energy of said second generated signal in the i th data packet, $R_{12}(t_i)$ is the correlation between said first and second generated signals in the i th data packet, and r_v represents a ratio variable of a portion of said first generated signal to a corresponding portion of said second generated signal.

21. (Previously presented) The system of Claim 20 wherein said calculator is configured to solve for a pair of values, r_a and r_v , by solving linear functions in x and y having the following form:

$$R_{12}(t_1)x - R_2(t_1)y = R_1(t_1)$$

$$R_{12}(t_2)x - R_2(t_2)y = R_1(t_2)$$

where $x = r_a + r_v$; $y = r_a r_v$

22. (Presently amended) A method using a computer for the enhancement of physiological signals for the measurement of blood oxygen in a subject, the method comprising the steps of:

directing first ~~an~~ and second light sources toward the subject, said first and second light sources producing light of first and second wavelength, respectively.

detecting first and second light signals after interaction with the subject and generating signals indicative of an intensity of said first and second detected light signals,

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said first generated signals having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source.

generating a plurality of data packets derived from data comprising said first and second generated signals, and

using a mathematical relationship of said first and second portions of said first and second generated signals and a ratio of said first portion of said first generated signal to said first portion of said second generated signal to generate at least first and second functions from said plurality of data packets, said at least first and second functions having a solution value indicative of said ratio.

23. (Previously presented) The method of Claim 22 wherein said ratio is indicative of blood oxygen saturation in the subject, the method further including the step of using a look-up table containing data relating said ratio to said blood oxygen saturation to determine the blood oxygen level in the subject.

24. (Previously presented) The method of Claim 22 wherein at least one of said plurality of data packets comprises filtered data from said first generated signal.

25. (Presently amended) The method of Claim 22 wherein at least one of said plurality of data packets comprises a component of said first generated signal with the DC removed.

26. (Previously presented) The method of Claim 22 wherein at least one of said plurality of data packets is derived from a group of signals comprising said first generated signal, filtered data from said first generated signal, said second generated signal, filtered data from said

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second generated signal, a combination of said first and second generated signals, and filtered data from said combination of said first and second generated signals.